



The

East New York

**GARDENER**

**Handbook**



Edited by Deborah Greig 2015  
Thank you to:  
Daryl Marshal, East NY Farms!  
David Vigil, East NY Farms!  
Martin Lemos, Cypress Hills LDC  
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Just Food  
596 Acres

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**UNITED COMMUNITY CENTERS, INC.** is a multi-service, intergenerational, community-based organization that provides services and support to residents of East New York, Brooklyn. For over 60 years, we've helped foster social change, worked with neighbors to address community concerns, and provided services to help make East NY a better, healthier place to live.

UCC's mission is two-fold:

- Provide services that meet the needs of the community
- Involve residents of all ages in social efforts to learn about and resolve community problems

Our current programs include: the Morris L. Eisenstein (MLE) Learning Center for 110 pre-school children; services for immigrants, including immigration assistance, English classes, and citizenship preparation classes; Protecting the East, a project that conducts sexual and reproductive health workshops, community-wide condom distribution and HIV/STDS prevention education and outreach.

At part of UCC and in partnership with local residents, the **EAST NEW YORK FARMS! PROJECT** improves access to fresh + healthy food, builds community and creates opportunities for youth to become leaders and form strong relationships with adults. We have been working with youth, gardeners, farmers, and entrepreneurs to build a more just and sustainable community since 1998.



Together, we are *growing food, nurturing leaders, and cultivating community* in East New York.

**East New York Farms! primary programs include:**

- **YOUTH LEADERSHIP**-We run a paid youth program from March -November for 33 youth ages 13-18.
- **ACCESS TO HEALTHY FOOD**-We run a weekly farmers' market and a market stand from July-November, educate community members and businesses about healthy, seasonal food and grow food in our own 1/2-acre youth- run farm.
- **GARDENERS GROWING MORE FOOD** - We run workshops, provides technical assistance and resources to over 100 individual gardeners in around 20 backyard & community gardens.

UCC+THE ENY FARMS! PROJECT



# EAST NY FARMS! CAN HELP YOUR GARDEN GROW!

**EAST NY FARMS! CAN HELP YOUR GARDEN GROW!**  
We provide a range of assistance to gardeners to increase production of fresh, healthy food for the neighborhood.

## GARDEN ASSISTANCE

- **INDIVIDUAL ASSISTANCE:** Staff are available for **crop planning**, and other advisory sessions.
- **YOUTH PROGRAM:** Over 30 young people participate in our Internship Program from March-November. Our youth work with gardeners to form positive, supportive relationships. Gardeners can schedule groups to work on garden tasks, specific projects and harvest assistance. **\*Gardeners MUST attend our annual Spring workshop in order to get youth help.**
- **VOLUNTEERS:** We can help you get volunteers for big projects. These groups may be able to provide supplies. Talk to **Roy** for more details.

## WORKSHOPS AND EVENTS

- We provide **WORKSHOPS** around the neighborhood on everything from “Beginning Gardening Tips” to “Beekeeping” to “Selling at Market”. Call **Deborah** if you would like a workshop at your garden.
- We can provide **support** for supplies, refreshments, cooking demos and publicity to gardens interested in **hosting EVENTS** for the public. Call **Daryl** for more info.

## SUPPLIES

- **FREE SUPPLIES** are often available for gardeners at workshops or on request: trellising, row cover, weed cloth/plastic, & seeds. If you need something just ask!
- We have **tools to borrow**; if you need a lot, request them at least **1 week in advance** (shovels, wheel barrows, etc...).
- **THE BACKYARD EXCHANGE** loans out **power tools** (circular saw, weed whacker, tiller and more). Call **Dennis 646.739.7118** for more info.
- **SEEDLINGS:** We grow high-quality, affordable and unique vegetable seedlings (transplants ) so that you can get a head start on the season.
- Get your plants at our plant sale in May!



- **COMPOST** is often available for gardeners in the Spring at our give-away. If you need a compost bin, let us know.

## GARDEN MEMBERSHIP

- If you need space to grow, look at our list of “**GARDENS THAT NEED MEMBERS**” or talk to **Daryl**. *With your energy, East NY’s gardens can thrive.*
- If your garden needs **MORE MEMBERS**, we can help! Talk to **Daryl**.

**SELLING AT THE MARKET** *Growing for market can provide people in the community with healthy food for their families, and help earn money for you & your garden.*

- **The Share Table** is a collective way for gardeners sell their produce.

## SMALL GRANTS

- Local residents, organizations, and businesses, with projects that promote access to healthy food in our community, can talk directly to *East New York Farms!* for grants information about small grants and help writing a strong application.

East NY Farms! is a partnership between gardeners & UCC staff.

**THIS IS WHAT YOU CAN DO TO HELP US TO SUPPORTING GARDENERS:**

1. **Help develop youth leaders.** Take the time to speak directly with youth & help them learn.
2. **Make your community garden welcoming.** Host events & open hours, keep your gate open, & post clear information about how **new members** can join. Everyone will be more supportive of community gardens if we show that they are for the community!
3. **Sell at the market.** Help thousands of market customers find healthy, fresh food. Most of our customers use EBT, WIC, and Senior coupons.

*For info about East NY Farms!, check our Events Calendar, website & Facebook, join our email list, or call our staff: 718.649.7979  
Visit us at United Community Centers 613 New Lots Ave!*

**Daryl Marshall—Community Organizer:** Garden membership, youth assistance, events at gardens, mini-grants program

**David Vigil- Project Director:** Special programming & long term project goals, Spanish speaking gardeners

**Deborah Greig- Agriculture Director:** Technical garden projects, Share Table, bees, crop planning, UCC Youth Farm, gardening workshops

**Heather Horgan- Markets & Outreach Coordinator:** Farmer’s Markets, Community Educator Program, Corbin Hill CSA

**Roy Frias- Youth Program Director:** Youth Program, Tours or Volunteers

**Shella Hair- Assistant Farm Manager** at the UCC Youth Farm





Chapter 1

# PLANNING YOUR GARDEN



WHY CROP PLAN? The following pages will give you ideas for creating your own Crop Plan that can help you grow healthy food all season long.

### A CROP PLAN CAN HELP YOU:

- Decide what & where to plant.
- Figure out how many plants you need. The “Planting Log” can help plan out and time what crops you want to grow.
- Learn ways to keep your plot productive all season long.
- Help prevent diseases & pests. Crops in the same plant family tend to attract the same pests and diseases. Using a crop rotation—of leaf (e.g. kale), root (e.g. carrots), and fruit (e.g. tomato)- can help break the cycle.
- Each plant family takes up different nutrients. Crop rotation helps minimize nutrient depletion from the soil.
- The “Garden Map” can help you figure out where you will rotate your crops each season. Look back at old maps to make sure you are moving your plants from year to year (we recommend a 3 year rotation).



*“I made an appointment and (soon) realized that Crop Planning is the way of the future...Each plot will maximize its full potential to produce... (It) is essential in teaching growers how to continuously eat (and grow) a variety of fresh healthy vegetables throughout the growing season (for us and) our community.”*

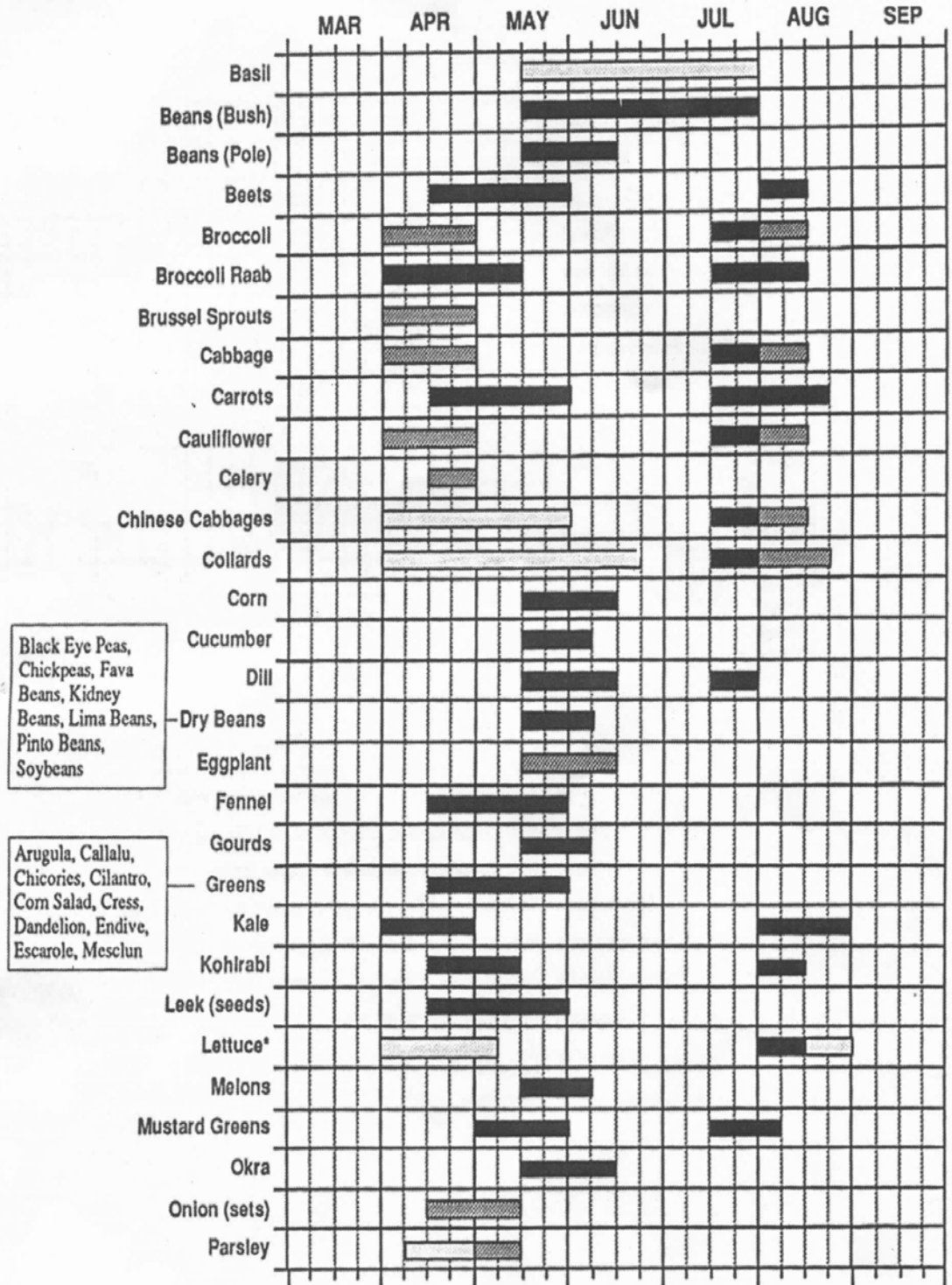
-ENY Community Gardener

# CROP PLANNING



# URBAN PLANTING CALENDAR

The NYC URBAN PLANTING CALENDAR lists planting dates for vegetables + fruit grown in the NYC area. These are recommended, based on the experience of gardeners, to get the best results no matter what the season is like.



\*Some varieties of lettuce are described as "heat-tolerant" or "summer lettuces" and can be planted by seed or transplant from mid-April until June 15.

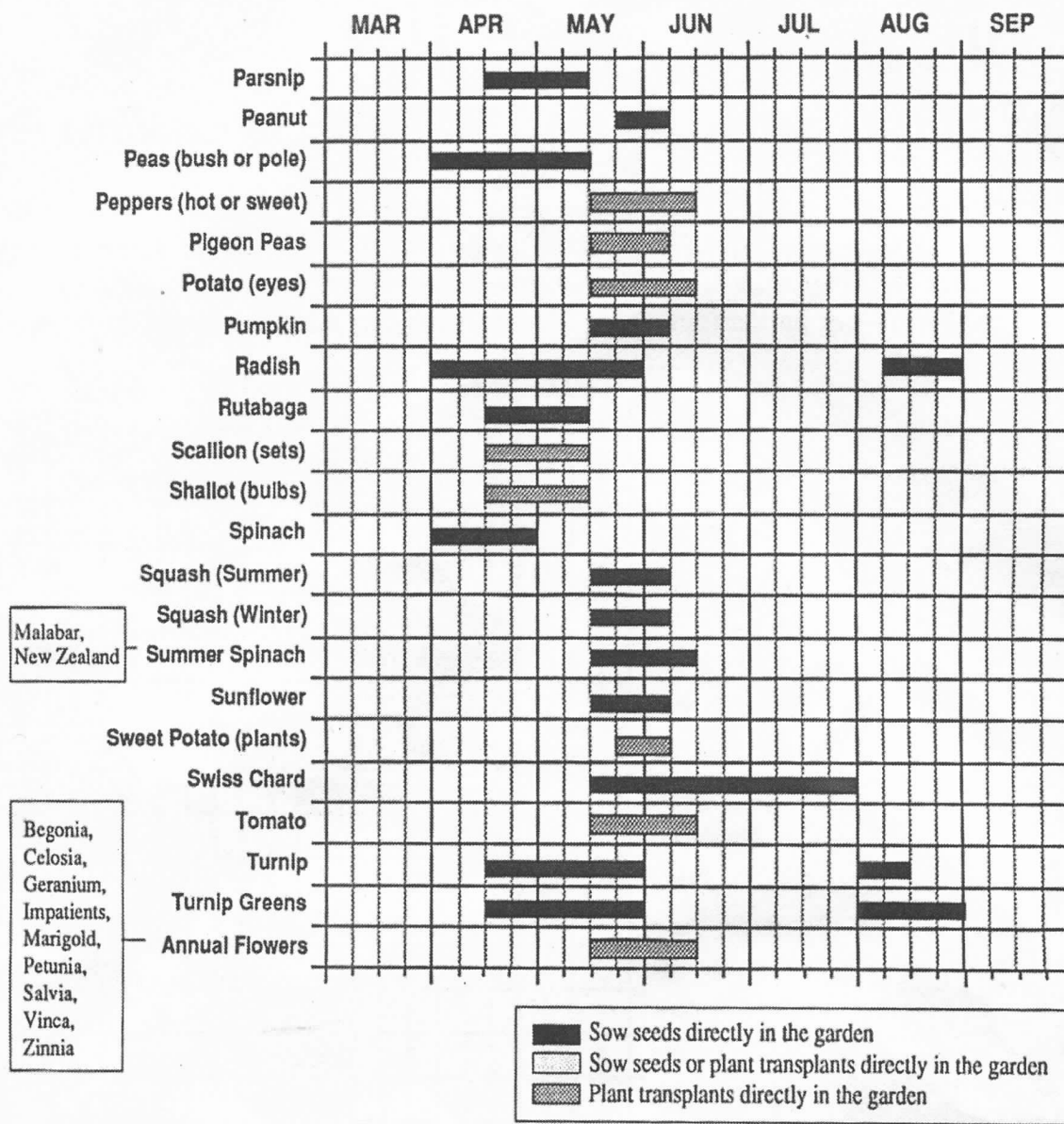
Sow seeds directly in the garden  
 Sow seeds or plant transplants directly in the garden  
 Plant transplants directly in the garden



# NYC URBAN PLANTING CALENDAR

## CONTINUED...

# URBAN PLANTING CALENDAR



### Special Consideration Crops

<b>Asparagus</b>	Best planted as crowns in a perennial garden, mid-April to end of May
<b>Chives</b>	Best planted as seeds or transplants in a perennial garden, mid-April to end of May
<b>Garlic</b>	Best planted as cloves in September or October
<b>Horseradish</b>	Best planted as root cuttings in a perennial garden, mid-April through end of May
<b>Jerusalem Artichoke</b>	Best planted as tubers, mid-May through early June
<b>Perennial Herbs</b>	Best planted as transplants in a perennial garden, mid-May through early June
<b>Rhubarb</b>	Best planted as crowns in a perennial garden, mid-April through end of May
<b>Strawberry</b>	Best planted as plants in a perennial garden throughout May

Source: Cornell Cooperative Extension, Gotham Gardener 1992 and Just Food City Farms Toolkit

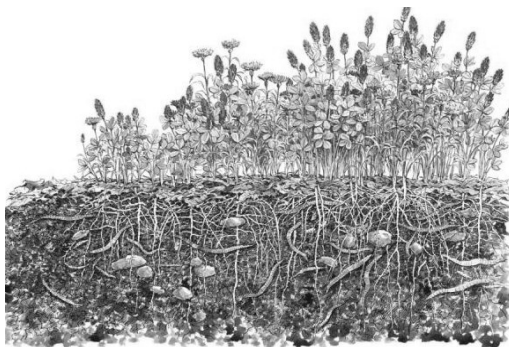
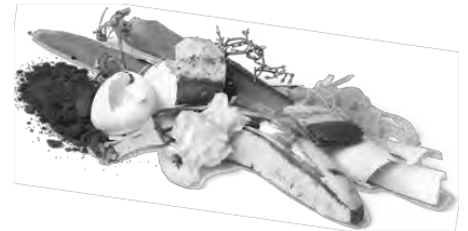


# SOIL MANAGEMENT

**SOIL** is a complex substance composed of solids, liquids, gases, minerals, and organic material. It's usually teeming with microscopic organisms that help break down materials and feed your plants. Treat it as a living substance that needs to be fed and cared for. **Always start with the soil;** if your soil and soil life is healthy, your plants will be more likely to grow healthy and strong and full of flavor.

## IMPROVING YOUR SOIL

**COMPOST** is like a multi-vitamin for your soil. It is a mixture of broken down green (nitrogen-based) and brown (carbon-based) materials. You can buy it, occasionally get it from the city, or make it yourself by combining things like vegetable and fruit scraps and dry leaves or torn up compost, water, air, and a little time. When applied to your soil, it will look like rich, black earth that will give your soil microbes and plants a chemical-free boost.



**COVER CROPS** are often called “green manure” because they offer many of the same benefits of chemical-free fertilizers like compost or manure. They also offer many other perks that keep your soil healthy and productive all season.

**SOIL TESTING** is the most important indicator of what nutrients you need to add to your soil. It is also the only way to detect harmful soil contaminants, that may have come from previous uses of the site that is now your garden. Soil tests cost around \$10 for lead and \$30 or more for nutrient and heavy metals tests.

**LEAD** is the most common contaminant found in urban soils. It can come from historical factors: from past automobile exhaust or old paint chips. There is no clear standard for what is considered “safe” but normal soil levels are under 120ppm (300ppm is considered safe for adults).



If you are concerned about **HEAVY METAL CONTAMINATION**, there are many ways to keep gardening while addressing the issue:

## PRECAUTIONS INCLUDE

- Wash all crops well and avoid eating root crops.
- Add **organic matter** (like compost and woodchips) to bind up metals so that your crops don't absorb them as easily.
- Keep **neutral soil Ph** levels (at or close to 7).
- **Mulch** and use **cover crops** to keep the dust down, wear gloves and wash hands after gardening.
- Grow crops in **raised beds** or containers with clean soil.



*Raised beds made from recycled scaffolding lumber from Build It Green*

## SOIL TESTING RESOURCES

- **Brooklyn College:** Environmental Sciences Analytical Center  
Phone: 718.951.5000x2647 Website:  
[www.brooklyn.cuny.edu/web/academics/centers/esac/services/soil.php](http://www.brooklyn.cuny.edu/web/academics/centers/esac/services/soil.php)
- **Cornell University:** Cornell Nutrient Analysis Lab (CNAL)  
Phone: 607.255.4540  
Email: [soiltest@cornell.edu](mailto:soiltest@cornell.edu)  
Website: [cna.cals.cornell.edu](http://cna.cals.cornell.edu)
- **Logan Labs:** \*Micro-nutrients test only  
Toll Free Phone: 888.494.SOIL  
Website: [www.loganlabs.com](http://www.loganlabs.com)
- **UMASS Amherst:** Soil Testing Lab  
Phone: 413.545.2311  
Email at [soiltest@umass.edu](mailto:soiltest@umass.edu)  
Website:  
<http://soiltest.umass.edu/ordering-information>

*Based on materials from GreenThumb, Bronx GreenUp/NYBG and Just Food's City Farms Toolkit*

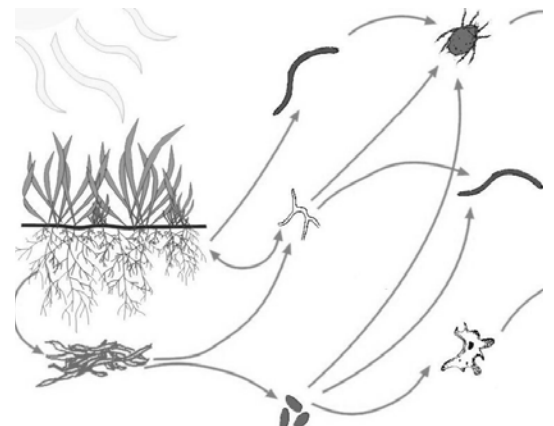


# COVER CROPS

**COVER CROPS** are often called “green manure” because they offer many of the same benefits of chemical-free fertilizers like compost or manure. They also offer many other perks that keep your soil healthy and productive all season.

## HOW CAN COVER CROPS HELP YOUR GARDEN?

- Protect the soil from **erosion** by wind, rain, & snow
- Improve **soil structure** by creating pores, which increase **aeration** and help the soil **hold water**
- Improve **soil quality** by feeding soil critters, like nitrogen fixing bacteria
- Add **nutrients** to the soil, especially after heavy feeding crops like tomatoes and cabbages
- Prevent **weeds** early in the season
- Attract **beneficial insects**
- Increase **crop yields**



Beneficial soil life from cover crop planting

## HOW TO PLANT COVER CROP

**CHOOSE A COVER CROP:** Use the chart on the opposite side of this page to choose a cover crop that fits your needs.

**PLANT THE SEED:** It’s OK if you still have food crops in your garden bed - you can “**under-seed**” the cover crop beneath food crops! Plant 6 weeks before the 1st frost (~October 15th).

- **Clean your plot.** Remove weeds and stake and prune crops that are still producing. This creates space and light for your cover crop to grow.
- **Rake the soil** to create a fine seedbed.
- **Spread the seed evenly** + gently rake in.

### TURN INTO THE SOIL IN THE SPRING:

- **Cut down cover crops** when they begin to flower, in April-early May. Leave them as mulch, or dig them into the soil.
- Wait 2-3 weeks before planting vegetables to allow time for the plant material to break down.

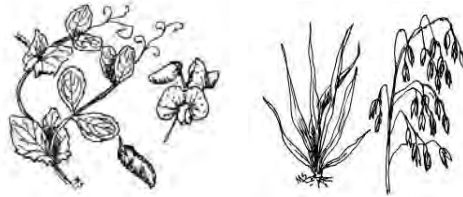


# COVER CROPS

**WINTER-KILL COVER CROPS:** *Planted in late summer and killed by the winter cold. These don't grow as much as over-wintering cover crops (see below), but you can plant early spring crops into the dead mulch next season.*

## Peas + Oats

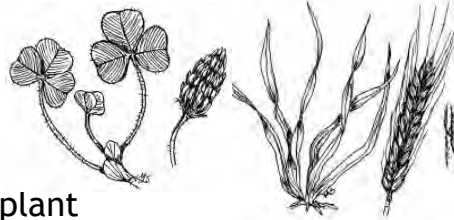
- Plant date: mid-August
- Oats grow quickly & suppress weeds
- Pea is a legume (fixes N)



**OVER-WINTERING COVER CROPS:** *These are planted in fall and survive the winter. Spring growth adds more organic matter and nitrogen (for legumes), but you need to wait until late April or early May to cut down the cover crop before you can plant vegetables.*

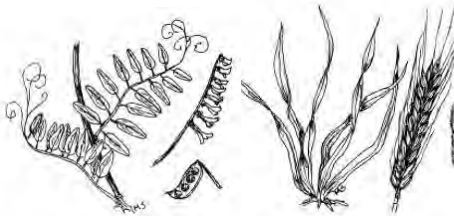
## Crimson Clover or Crimson Clover + Winter Rye

- Plant date: early September
- Crimson clover is a legume (fixes N), & attracts beneficial insects. Somewhat shade-tolerant.
- Rye grows quickly and produces lots of plant material for soil quality, weed suppression, and mulch.



## Hairy Vetch or Hairy Vetch + Winter Rye

- Plant date: late September - early October
- Hairy vetch is a legume (fixes N) & attracts beneficial insects.
- Rye grows quickly and produces lots of plant material for soil quality, weed suppression, and mulch.



**SUMMER COVER CROPS:** *These are planted in the window after early spring crops (like lettuce) and before crops for a fall harvest (like broccoli or kale). These cover crops can shade out weeds and add organic matter in the few months between spring and fall plantings.*

## Buckwheat or Buckwheat + Crimson Clover

- Plant date: May - early August
- Buckwheat grows quickly, suppresses weeds, and attracts beneficial insects. Trim the buckwheat when it starts flowering to give the clover light to grow & fix nitrogen.



Buckwheat

Based on materials by Megan Gregory

# MANAGING PESTS

There are many practices that may be used to help reduce **INSECT PESTS, DISEASES + WEEDS** in gardens. One of the most helpful ways to deal with them is to **learn about them**: which ones are **beneficial** or harmful, their habitat, their life cycle, what they eat and their behavior.

## DEFINITIONS

- **PESTS** are organisms that are damaging to our crops.
- **DISEASES**, bacteria, fungi or parasites effect overall plant function.
- **WEEDS** are plants that are growing where they are not wanted. They can negatively impact the crop you are trying to grow. E.g. if a tomato plant is in a bed that has collards in it, it can cause spacing and pest issues and should be seen as a weed.
- **INTEGRATED PEST MANAGEMENT (IPM)** uses different strategies to address pests in the garden. Instead of using chemical pesticides, there are many options that can minimize plant damage. IPM, is a process you can use to solve pest problems while minimizing risks to people and the environment. It works to develop long term pest management strategies. IPM can be used when dealing with weeds and disease as well.

**SCOUTING:** Make weekly checks to find issues throughout the growing season. Talk to other gardeners to see what they have and work together to address problems early.

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## 14 IPM STRATEGIES TO KEEP YOUR PLANTS HEALTHY

1. **START WITH THE SOIL:** Soil fertility, moisture level and PH can effect the health of your plants. Making sure you do regular **soil tests** and that your plants have the proper nutrients available to them will ensure healthy growth. The easiest way to do this is to apply **COMPOST** every season.
2. **CHOOSE RESISTANT or TOLERANT VARIETIES** to pests + diseases. Ex. Cucumbers that are resistant to wilt produce longer.
3. **INSPECT PLANTS** before planting. It's important to start with healthy plants. Unhealthy plants may never yield as much as healthy ones or may die while young. If you save your own seed, harvest it from healthy plants, dry it well and store in a cool, dry place.

# MANAGING PESTS

**4. SPACE PLANTS TO ALLOW AIR CIRCULATION:** High humidity and moisture encourage the development of diseases and increase pest presence. Allowing enough room for plants to grow and space for air to circulate reduces promotes rapid drying of leaves and fruit.

**5. TIME OF PLANTING:** Plant crops at times that avoid the most active feeding stage of an insect's life or certain weed pressures, e.g. plant zucchini in early July to avoid squash vine borer damage.

**6. WATER:** Most plants require 1 inch of rainfall or irrigation per week. **Water in the morning** so they dry off quickly. Avoid using overhead sprinklers; they can spread infections. **Drip irrigation** puts water directly at the root zone and does not wet the plants. Planting in **raised beds** with good drainage, or mulched with straw to help retain moisture.

Work in your beds when plants are dry because moisture spreads diseases.

**7. CLEAN UP:** Remove weeds and plant debris, which can be ideal places for insects to overwinter and infect new plants the next season. Composting, unless the pile becomes *very* hot, does NOT eliminate pathogens from plant debris. Always remove plants that show signs of a **disease** and put them in the trash.



*Marigolds keep cucumber beetle away from squash & cucumbers*

## 8. PLANT PARTNERSHIPS:

- **Companion Planting** - Some plants contain compounds that repel insects. Planting these next to crops can provide control for some pests, e.g. garlic will deter aphids. Some plants attract beneficial insects that help pollenate or eat pests.

- **Diversified Planting** - Planting different crops together will force pests to search for food and expose them to predators.

- **Trap Plants** - Placing certain plants that lure insects away from crops can work as a control. Once the trap plants become infested remove the plant.

## 9. PHYSICAL BARRIERS placed around plants and can control pests:

- **Cardboard collars or disposable cups** 4 inches high and 2 inches deep in the soil around young plants prevents cutworms, cabbage maggot fly and squash vine borers from depositing eggs on the plant.





# MANAGING PESTS



- Mulches**- Back plastic, straw and other ground covers keep weeds down, heat up the soil and keep in moisture.

- Row cover** is placed over plants until the pest is gone or the plants are large enough. All covers should be removed as temperatures become too hot. Some plants need to be insect pollinated or they will not yield a crop (cucumbers, melons+ squash.)

- Traps**, like yellow sticky boards, can be used to track insect populations, but are seldom helpful with a major issue. They help to manage whitefly populations as long as sticky material is replaced when insects cover the boards.

- Spray soap or clay**- Soapy water sprayed on beetles will dehydrate them, killing them within a minute. Some growers coat their plants with kaolin clay (mixed with water). When some pests come in contact with the clay, they focus entirely on cleaning themselves, rather than destroying the plant.

**10. HAND-PICKING:** Remove pests by taking them off the plant and placing it in a bucket of soapy water.

**11. ROTATE CROPS:** Planting the same crop in the same place year after year may cause pest and disease buildup. Rotate plants of the same type to different areas to help break the cycle.

**12. PLANT FALL COVER CROPS:** After cleaning up the garden plant a cover crop. This “green manure” will grow thickly and reduce weed pressure. In the Spring, turn it into the soil or add it to your compost. They can also reduce the populations of certain soil-borne disease agents, e.g. mustards release natural chemicals which can reduce the numbers of soil borne pathogens.

**13. ESTABLISH GOOD RECORD KEEPING:** As a gardener, detailed notes on pests, diseases and weeds can help in planning for the following season.

**14. BENEFICIAL INSECTS, BACTERIA+ FUNGHI** support pollination, nutrients absorption+ pest control. Attract beneficial insects by growing flowering and native plants in the garden, which provide additional food and habitat for predators of insect pests.



*A tomato horn worm being parasitized by wasp eggs*



# SOME COMMON PESTS FOUND IN EAST NY

## 1. APHIDS

**Identification:** Aphids are small, pear-shaped bugs that live in large groups on the underside of leaves. Some have wings, some don't. Some are white, others grey, red, brown, or black. Adults suck sap out of the leaves of many vegetables, fruit, or trees, leaving them lifeless and the whole plant injured.



**Life Cycle:** There almost always is a population of aphids in a garden. Trouble comes when the population grows.

**What do I do?!:**

- **Lacewings** feed on aphids, so planting flowers that attract them is a great natural way to keep their numbers at bay.
- **Soapy water** can also be sprayed.

## 2. FLEA BEETLES

**Identification:** Flea Beetles are small, oval-shaped beetles. They hop like fleas around the garden and eat various crops, their favorites include bok choi, cucumbers, eggplants, and spinach. Adult flea beetles make many tiny pin holes. Their larvae, meanwhile, feed on a plant's roots and tubers.



**Life Cycle:** Flea Beetles overwinter as adults, waking up in May/June.

**What do I do?!:**

- Use **row cover** to protect young plants.
- Later in the season, if a small number of beetles attack your plants, brushing them into a bucket with **soapy water**.
- **Keeping weeds in check** reduces the beetle's habitat.

## 3. WHITEFLIES

**Identification:** Whiteflies are tiny, sap-sucking insects. They excrete sticky honeydew so leaves may be sticky or covered with black sooty mold and cause yellowing or death of leaves. The honeydew attracts ants, which interfere with the activities of natural enemies that may control whiteflies and other pests. Outbreaks



UC Statewide IPM Project  
© 2000 Regents, University of California

MANAGING PESTS



# MANAGING PESTS

often occur when beneficial insects are disrupted.

**Life Cycle:** Whiteflies develop rapidly in warm weather. Most have a wide host range that includes many weeds and crops.

**What do I do?!** Whiteflies are not controlled with any insecticides.

- **Hand-removal of leaves or plants** heavily infested may reduce populations to levels that natural enemies can contain. Water sprays may also be useful in moving adults.
- Whitefly populations in the early stages can be reduced with a vigilant program of **removing infested leaves or hosing down with water.**
- Aluminum foil or **reflective mulches** can repel whiteflies. When it gets too hot, remove mulches to prevent overheating plants.
- **Sticky traps** can be used to reduce numbers.
- **Soaps or oils**, such as neem oil, you may reduce but not eliminate populations.

#### 4. CUCUMBER BEETLES

**Identification:** Cucumber Beetles are oval-shaped insects, yellow and black in color, striped or polka-dotted. They eat all cucurbits ( melons, squashes, and, of course, cucumbers). Their impact comes from causing **plant disease**, including squash mosaic virus, powdery mildew, and, worst of all, **bacterial wilt**, which prevents nutrients from traveling through the plant, killing a healthy cucurbit in as little as 7 days.



**Life Cycle:** Cucumber beetles over-winter as adults in bordering vegetation and plant debris. They actively start feeding as days get warmer in the Spring and Summer.

**What do I do?!:** Control measures for Cucumber Beetles are the same as for Flea Beetles (physical barriers, hand picking, soapy water solution, keeping weeds down). *If you already know that cucumber beetles frequent your garden, take proactive measures:*

- **Trap crops:** A week or two before your cucurbit planting date, plant a border of decoy cucurbits around your planting area. The bugs will be attracted to this area, which will make the rest of your cucurbit beds less appetizing to them.
- **Plant Late:** Wait a few extra weeks until after the first cycle of cucumber beetles passes.
- **Cover them with row cover.** Remove the cover once the plants start flowering to allow for pollination!
- **Hand Pick.** If beetles attack at the seedling stage, remove as many as you can then cover the plants to prevent more beetles from landing on them.
- **Sticky traps** can be effective - attach a little tea bag to the sticky paper with attractive floral scents, such as cinnamon, cloves or bay



# MANAGING PESTS

leaves.

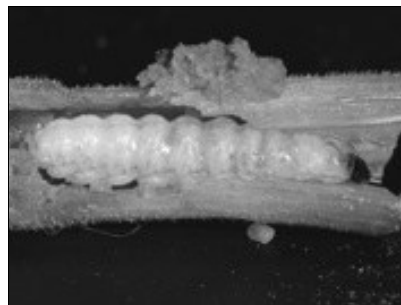
- **Spray with soap or clay:** Soapy water sprayed on the beetles dehydrates them, killing them within a minute. When the beetles come in contact with clay, they get dusty and focus on cleaning themselves vs. destroying the plant.
- **Clean Up** in the fall will make for a better season the next spring. Cucumber beetles overwinter in the soil and leftover plant debris.

## 5. SQUASH VINE BORER:

**Identification:** Adult borers resemble a wasp. It is about 1/2 inch long with an orange abdomen with black dots. The larvae are white with brown heads, growing to almost an inch in length.



**Life Cycle:** In late June/early July, adults emerge from cocoons in the ground. Soon after emerging, borers lay eggs at the base of susceptible plants (summer squash, winter squash and pumpkins). One week later, the eggs hatch and larvae bore into stems causing the stem to wilt; larvae feed through the center of the stems, blocking the flow of water to the rest of the plant. Close inspection reveals holes filled with moist orange sawdust-like material called **frass**. They feed for 4-6 to weeks, then burrow into the soil and stay there until the following summer. There is one generation per year.



### What do I do?!:

- **SCOUT** for adult borers starting the last week of June.
- **Yellow trap pans**, any YELLOW container filled with water, can detect borer adults. Adults are attracted to yellow and will fly to be trapped when they fall into the water. Place traps by late June, and check least once a day. When you notice squash vine borer adults in your traps you know it is time to take further action.
- **Plant crops** that are not attacked by squash vine borers, such as butternut squash, cucumbers & melons.
- A **2nd planting** of squash in early July will mature after adult borers have finished laying eggs.
- **Pull and destroy** any plants killed by squash vine borers.
- Remove larvae and **bury the damaged stem**. It will develop new roots and can recover.
- Place **row cover** over your crops for about 2 weeks after the 1st borer is seen. Be sure it is secure to prevent adults from moving underneath. **Caution:** Do not use row covers when crops are flowering, it prevents pollinating and vegetables production.

# MANAGING DISEASE

## SOME COMMON DISEASES FOUND IN EAST NY

### 1. BACTERIAL WILT ON CURCUBITS (cucumbers, squash and melon):

**Identification:** Cucumber & melon plants are severely affected. Leaves and plants wilt and die rapidly. Wilting is most severe early in the season when plants are rapidly growing. Foliage appears yellow before entire plant collapses and dies.

**Life Cycle:** This disease is spread among plots by the **cucumber beetle**. Beetles feed on leaves and stems and bacteria multiply in wounds and enter the water conducting vessels and then move to the stems. Bacteria then build up resulting in wilting of plants. It later spreads to the entire plant.



**What do I do?!:**

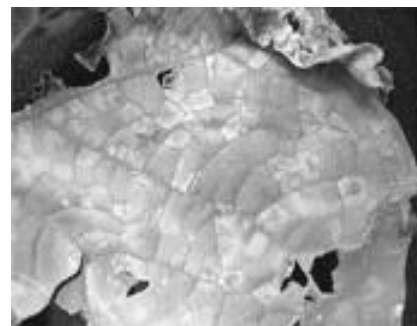
- **Crop rotation** reduces beetle numbers.
- **Remove infected plots.**
- **Row covers** to exclude beetles.

### 2. DOWNEY MILDEW CURCUBITS

**Identification:** This is one of the most important foliar diseases of cucumber, melon, squash and pumpkin. It becomes prevalent under favorable temperature and humidity conditions.

Only leaves of plants are affected by the disease. Initially spots are pale green, then yellow before tissue dies. Several spots occur together in a group. On the underside of leaves, spots appear water soaked at first. Leaf petioles remain green and upright after leaf blade has died and drooped. Spores of the downey mildew are purplish grey and develop only on the underside of leaves.

**Life Cycle:** This disease only infects members of the cucurbit family. Source of infection is wind blown spores. The spread within a garden plot can be through air currents, rain splash, workers and tools.



**What do I do?!:**

- **Scout crops weekly** for symptoms.
- Plant in areas with **full sun.**
- Avoid overhead irrigation, use **drip** instead.
- Use generous spacing to increase good **air circulation.**

### 3. LATE BLIGHT ON TOMATOES

**Identification:** This is the most destructive disease of potatoes and tomatoes. It is a “community disease” and spreads easily through wind and rain and is capable of destroying the entire crop within a few days. Classic symptoms are large olive green to brown spots on leaves with white fungal growth on the underside when conditions are humid.

# MANAGING DISEASE

Sometimes the infected plants have a water soaked appearance. Leaf lesions begin as tiny, irregularly shaped brown spots. Also brown to blackish lesions may

develop on upper stems. Firm brown spots may develop on tomato fruits.

**Life Cycle:** In the Northeast it survives in potato tubers saved from the previous year and in cull piles that did not freeze during winter. The pathogen survives in infected crop debris and soil. It also needs living tissue to survive and does not survive in the soil and is not seed borne.

## What do I do?!

- Regularly check with **community gardeners**.
- Learn the **symptoms**.
- Start season with **disease-free transplants**.
- Plant **resistant varieties**.
- Regularly **inspect plants** for symptoms.
- Work in affected plots last and **not when it's raining**.
- Throw all tomato volunteer plants, infected tomato transplants and weeds, such as hairy nightshade, bittersweet nightshade which are hosts for the disease in the **TRASH**.



## BLOSSOM END ROT ON TOMATO

**Identification:** This is a serious disorder of tomato grown in home gardens. It is especially common in plants that are exposed suddenly to a period of drought. When the roots fail to obtain sufficient **water and calcium** the fruit tissues break down and they become rotted on their basal ends. Initially a small, water soaked spot appears, which grows and darkens rapidly as the fruit develops. The spot can cover as much as 1/2 of the entire fruit surface. Large lesions soon dry out and become flattened, black and leathery.

**Life Cycle:** Symptoms may occur at any stage of fruit development, but most commonly, are often seen when fruit is 1/3rd to 1/2 full size.

## What do I do?!

- Plant in well drained, aerated soils.
- Mulch plants to conserve moisture in times of stress.
- Avoid disturbing soil too near the plants so as not to damage feeder roots.
- Maintain a even supply of water through irrigation and avoid extreme fluctuations.



# MANAGING WEEDS

**WEEDS** compete with crops for water, light and nutrients. They also interfere with harvesting, reduce yields, and harbor insects + diseases. Control options include physical and cultural approaches.

## PHYSICAL WEED MANAGEMENT OPTIONS

- **Hand Weeding:** Remove weeds to avoid moving weed seeds close to the soil surface where they can easily germinate. Always remove as many roots as possible.
- **Cultivation:** Remove weeds when they are as small as possible to minimize soil disturbance and impact your crops.

*However, for highly effective control use **physical methods** and **cultural methods** such as crop rotation, composting of manure and keep nearby weeds from seeding.*

## CULTURAL WEED MANAGEMENT OPTIONS

- **Cover crop:** Growing cover crop (as a “green manure”) has many benefits. They can suppress weeds; through competition, release of plant growth-inhibiting substances (allelopathy), blocking sun and water for weed seed germination and alter soil microbial communities to put certain weeds at a disadvantage.
- **Light tillage:** Light soil disturbance kills germinated weeds and moves seeds to the surface where they can germinate. Repeated tillage before planting will reduce weed seed accumulation if you knock them down a few times.
- **Plant Competition:** Use transplants wherever possible and reduce spacing if your pest and disease pressure is low. This will give you a head start on weeds and can shade them out.
- **Mulching:** Often use to control weeds. They can be organic (hay, straw etc.) or inorganic (black plastic etc.).
- **Time:** If, for example, you have compost with a lot of weed seeds, time ensures that some of those seeds are too old to germinate.

**Common Weeds in East NY:** amaranth/weedy callaloo, chickweed, dock, galinsoga, Japanese knot weed, morning glory, mugwort, sticky weed/carpet weed and more!



## THINK ABOUT S.P.A.C.E:

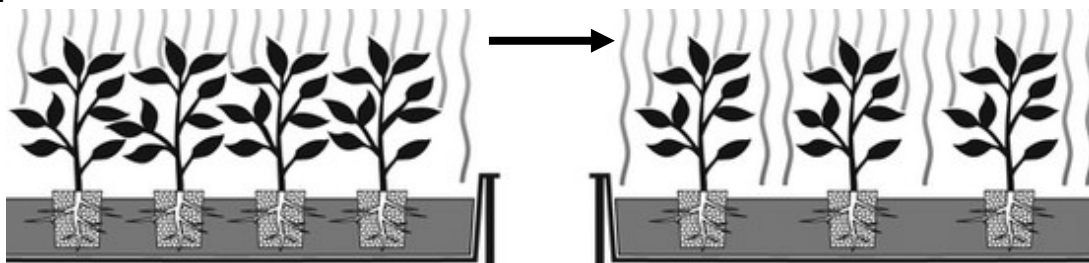
Your seeds & seedlings are small now, but they grow into much larger plants. The way they are spaced in your bed effects their health and production.

**SPACE:** Some plants need more **SPACE**; a tomato gets much bigger than a radish! Think about how big plants will get when trying to place them.

**P**roduction: If plants are too close, they won't have enough room or nutrition from the soil to grow and *produce more* for you. \*It is important to “thin” (take out some baby plants to make space for the roots of others to get big).



**A**ir: Air between plants helps reduce the spread of diseases and pests. If plants are too close, they will brush up against each other and quickly spread these problems.



**C** your seed packet: Read your seed packet for spacing suggestions.

**E**fficient Techniques continued on the next page...

# PLANT SPACING





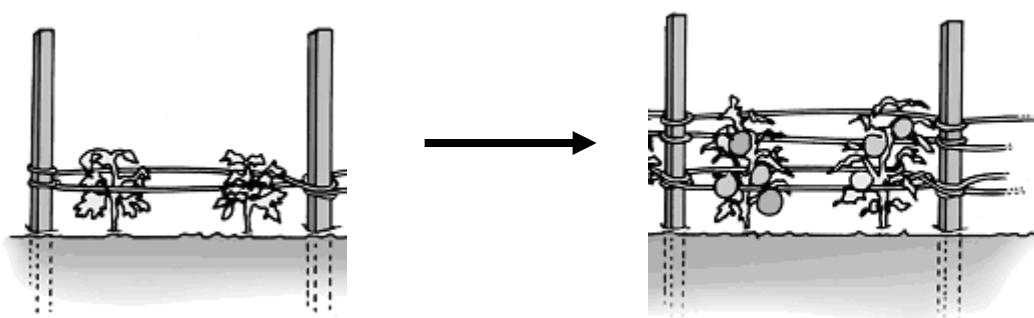
# PLANT SPACING

## Efficient Techniques:

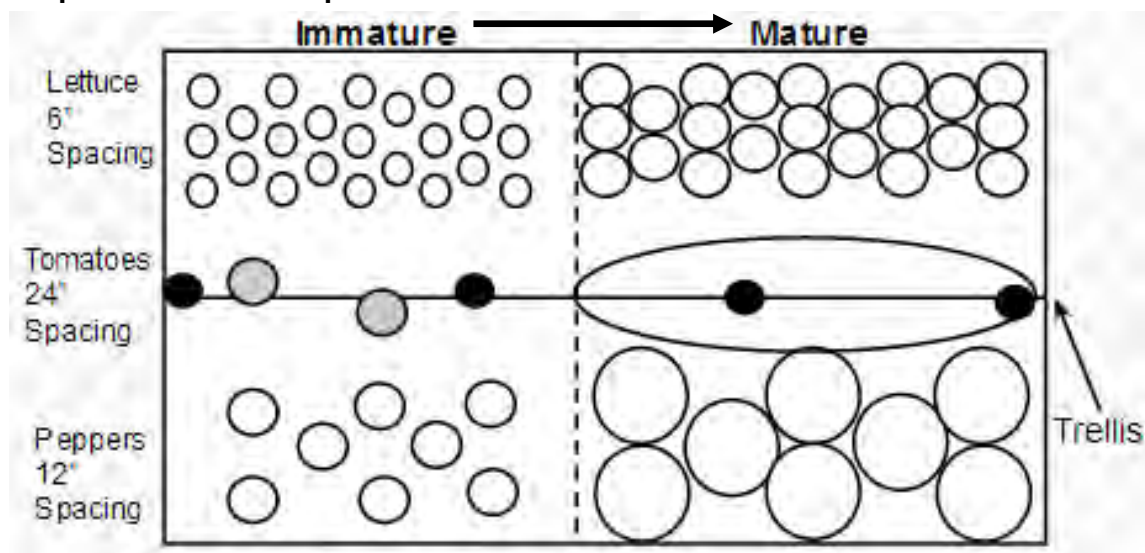
- **Interplant**-Use your space efficiently by trellising plants that climb (cucumbers) or place plants that are smaller or quick to harvest next to ones that are slow to grow (e.g. basil along side your tomatoes.)
- Try to place tomatoes, cucumbers, and squash near the center of your bed. Then they won't spill into the pathways.
- **Trellis + prune** plants like cucumbers and tomatoes to promote air flow and enable interplanting.



*Slow scallions with quick lettuce.*



- Plant in a **TRIANGLE** (offset) pattern to give your plants more space:





# PLANT SPACING

VEGETABLE	BETWEEN ROWS "=inches	IN ROW	HOW TO PLANT
Radishes, Carrots, Beets, Turnips	8"	2"	Direct Seed, one seed every inch and then thin to correct spacing
Beans	12-18"	6"	Direct seed one seed every 3" and thin to correct spacing
Cilantro, Parsley	8"	4"	Direct Seed, one seed every inch and then thin to correct spacing
Lettuce heads, Bok Choy, Mustard Greens	8-10"	10"	Transplant or Direct seed. For small leaves like salad mix, sow every inch in rows 5" apart.
Peppers	12"	18-24"	Transplant
Cucumbers	18"	12"	Direct seed or Transplant, can trellis
Summer/Winter Squash	24"	24"	Direct Seed or Transplant
Tomatoes, Okra	18"	24-30"	Transplant tomatoes; direct seed okra at the end of May when the ground is warm.
Eggplant	12"	18-24"	Transplant
Kale, Collards	12"	12-15"	Transplant or Direct seed
Swiss Chard	12"	12"	Every 2 or 3 weeks during the spring & late summer
Celery	10"	10"	Transplant, very slow growing
Bitter Melon	18"	24-30"	Transplant and trellis



# TRELLISING

TRELLISING certain crops is a great way to **save space in the garden, reduce disease, add support, increase production, make harvesting easier, and enhance the overall *health of your plants!***

## WHAT CAN I TRELLIS?

Trellising works best with **fruiting crops**. Many crops are naturally sprawling and can be grown vertically with a little support. *Trellis:*

Tomatoes	Peppers	Melons
Eggplants	Cucumbers	Flowers
Bitter melon	Peas	Pole beans

## WHEN DO I TRELLIS?

Have your trellis ready to go *before* the plant needs support. It is really difficult to trellis once your plants are big. Use a correct spacing, pruning and trellising from the start of the season.

## HOW DO I TRELLIS?

There are many different trellising methods. You can use found or purchased materials, and existing fences. It is important to start off with a strong structure to support your plants. They seem small now, but will get big! The metal tomato cages and other prefab trellis are often not strong enough and make it difficult to harvest and prune.

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## TYPES OF TRELLISING

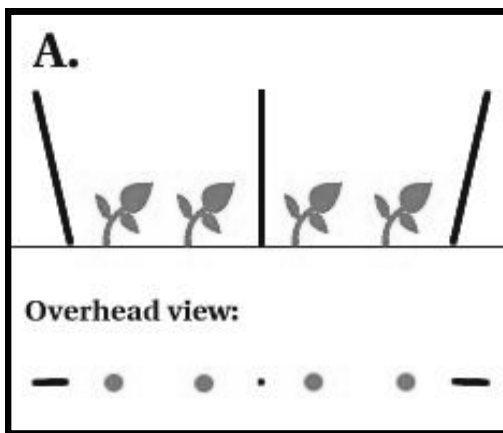
### 1. THE FLORIDA WEAVE

for tomato, pepper + eggplants:

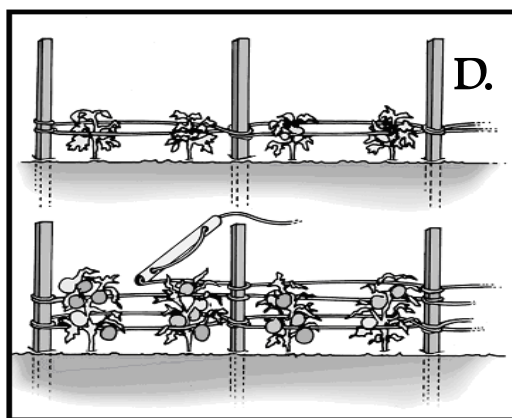
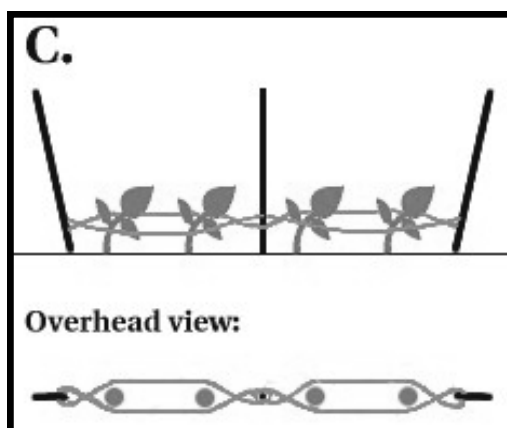
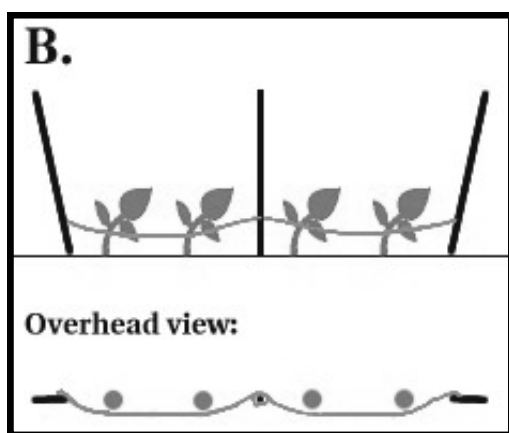
This technique uses strong posts ( 6' u-posts or 2x2's pounded at least 1.5 feet in the ground).



A. Posts can be placed every 2 to 4 plants in a row.



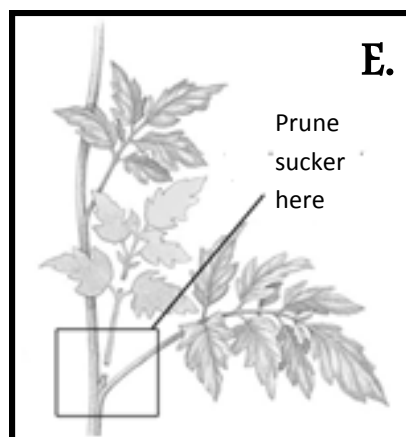
B&C. Add a level of string that can be tightened throughout the season to both sides of the plants.



D. Add a level of string every time the plants grow.

E. For tomatoes you can prune the plants to promote tastier fruits and reduce diseases.

Prune off lower leaves to promote airflow. Prune each plant to 2-4 main branches to keep them disease free and produce the tastiest tomatoes.



# TRELLISING



# TRELLISING

## 2. WIRE OR PLASTIC MESH + POSTS:

Vertical trellising works well for pole beans, bitter melon, and cucumbers.



## 3. BEAN TEEPEE:

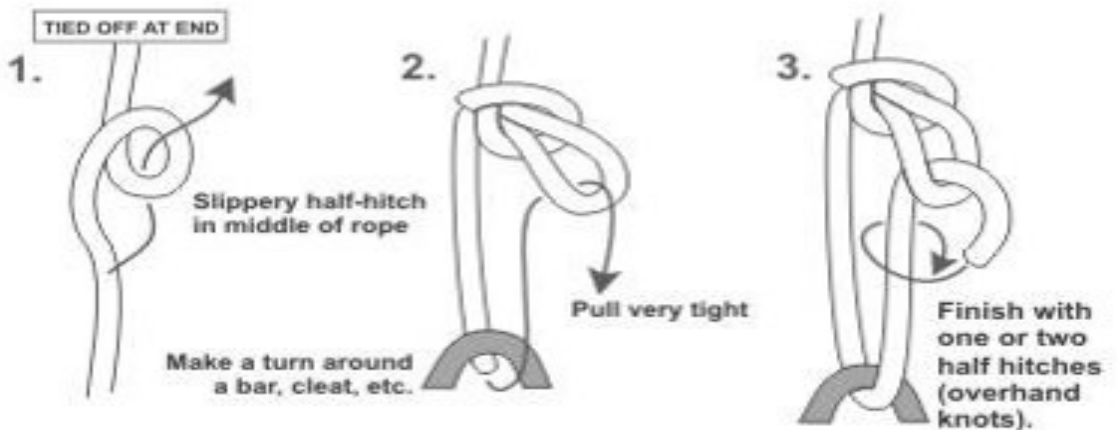
This one is great for kids!



## KNOTS

Learning a couple handy knots makes your trellis easy to tighten.

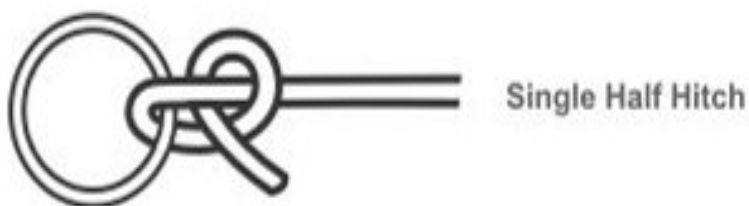
**THE TRUCKER'S HITCH** is one of those knots that once you learn it, you wonder how you got along without it! This combination of knots allows you to pull string as tight as a guitar string.



## TRUCKER'S HITCH Continued...

Tie off one end of the rope. Lay rope over load to be tied down. Tie a slippery half hitch in the middle of the line to form a small loop. With free end make a turn around a fitting and bring the free end back up to the loop in the line. Feed through and pull line very tight. Secure the know with the tension in the line with one or two half hitches (over hand knots) tied to snug to the loop.

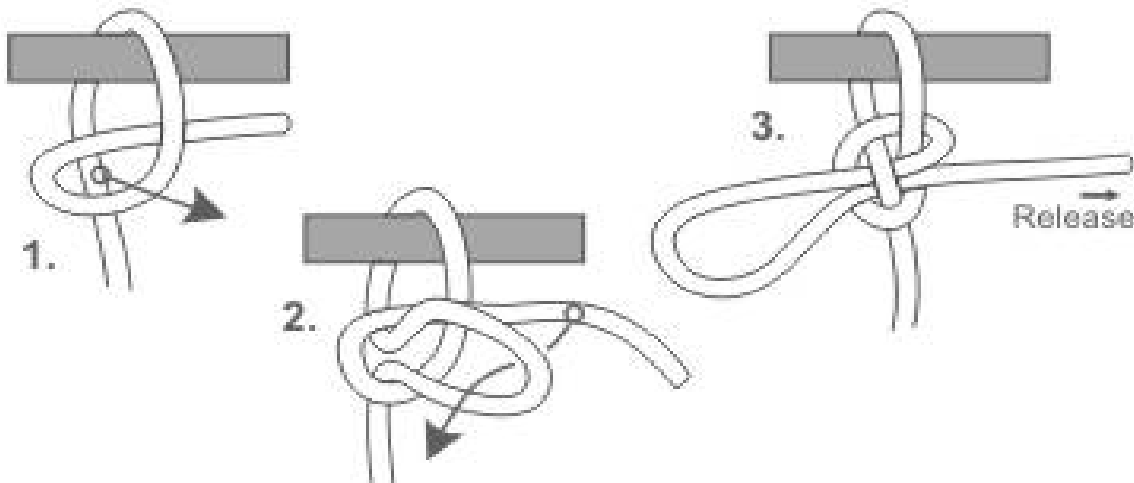
**HALF HITCH** Use this in combination with many important knots. Use two stitches to tie a rope to any object.



© Copyright 2009 John E. Sherry

[www.netknots.com](http://www.netknots.com)


**SLIPPERY HALF HITCH** Use this knot with the Truckers hitch when tying trellis so that you can undo your knot to tighten the strings supporting your plants if they get loose.



TRELLISING

# PLANTING FOR A CONTINUOUS HARVEST

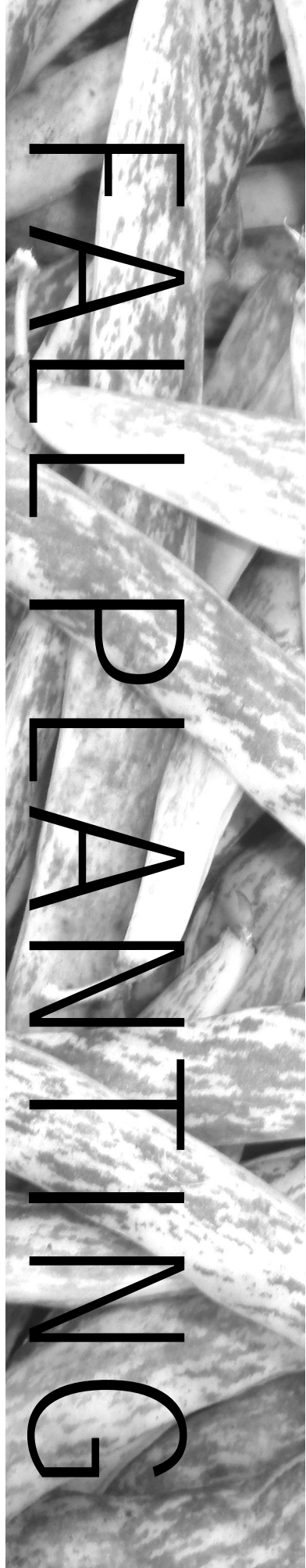
PLANTING A CROP MULTIPLE TIMES throughout the season lets you eat, harvest + sell from June to November.

CROP	SCHEDULE
Bush Beans	
Beets, Carrots, Turnips	
Lettuce, salad greens, & mustard greens	
Bok Choi	Monthly
Cucumbers, summer squash	2 <sup>nd</sup> + 3 <sup>rd</sup> plantings at monthly intervals will keep quality high
Kale, Collards	Spring & mid-summer
Spinach, Chard	Every 3 weeks during the spring + late summer

## TIPS:

- Experiment with different cold or heat-resistant **varieties**.
- Be aware of the **frost dates** (May 15<sup>th</sup> + October 15<sup>th</sup>); anything planted too close to the frost date will not get enough daylight and can freeze if not under cover.
- Try **season extension** methods like row cover and cold frames to extend your season at either end.





Plant vegetables for **FALL HARVEST** during the summer months. We are lucky to have the longest growing season in NY State; the cool days & nights of Fall are ideal for growing fall crops.

Planting times should correspond to harvesting vegetables around the time of the first frost in this area (Oct 20<sup>th</sup>), even though harvest can extend well up to Thanksgiving.

Sept 1-Oct 20=50 Days    Aug 15-Oct 20=66 Days  
 Aug 1-Oct 20=81 Days    July 15-Oct 20=97 Days

TYPE	CROP	DATE TO PLANT
Brassicas	Broccoli, Cabbage, Cauliflower, Collards, Kale	Seed: July 15-30 Transplant: Aug 15-20
	Kohlrabi, Mustard	Seed: August 1-20
	Brussels Sprouts	Seed: July 1-10 Transplant: July 15-30
Asian Vegetables	Bok Choi	Seed: August 1-20
Leafy Greens & Herbs	Lettuce, Arugula, Basil, Cilantro	Seed: August 15-Sept 1 Transplant: July 15-30
Root	Beets, Carrots, Turnips, Radish	Seed: Aug 15-Sept 1
	Onions	Sets/transplants: August 15-Sept 15
Bush Beans & Peas		Seed: August 10-20

*Based on materials by Cornell Cooperative Extension*

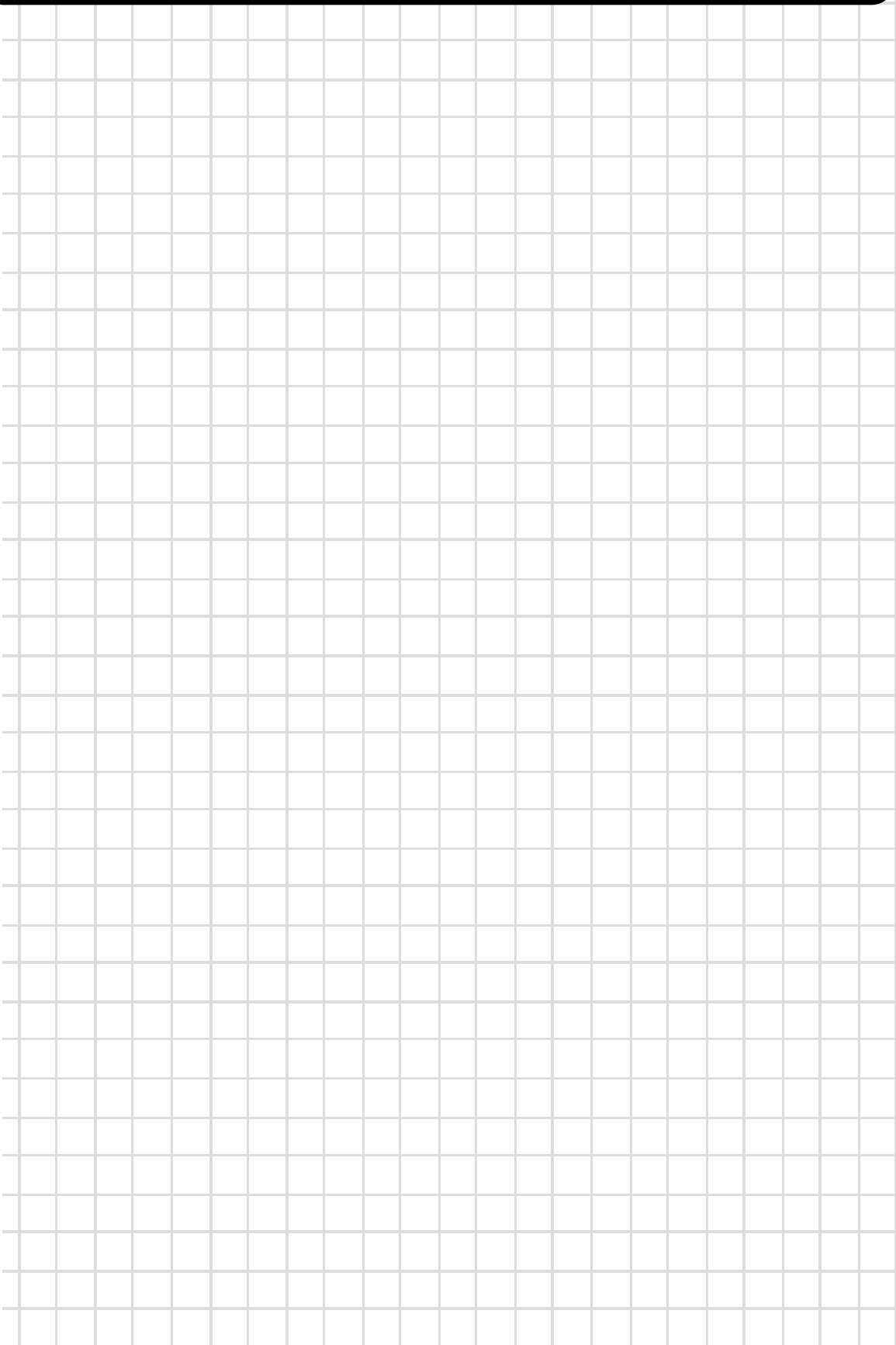






**GARDEN MAP**

**Year:**



CROPPING PLAN









Chapter 2

# GROWING FOR MARKET



GROWING FOOD FOR MARKET can provide people in the **community** with healthy food for their families, and can help earn **money** for you + your garden.

## BIG SELLERS AT THE MARKET

### VEGGIES:

- Bok choy
- Collards\*
- Callaloo\*
- Cabbage
- Malabar spinach\*
- Swiss Chard
- Green beans
- Long beans\*
- Bitter Melon\*
- Cucumbers
- Pumpkin\*
- Zucchini\*
- Turnips
- Eggplant\*
- Okra\*
- Peppers
- Garlic\*
- Onions
- Scallions\*

### HERBS:

- Cilantro\*
- Parsley
- Thyme\*
- Celery\*
- Honey\*



### FRUIT:

- Berries\*
- Grapes\*
- Melon\*
- Figs\*

**Crops with a (\*) are in very high demand.**

GROWING FOR MARKET



# MARKETING & DISPLAY

An eye-catching MARKET STAND is a great way to draw in customers and show off your beautiful produce. Once you have people looking at your stand, it's easier to sell and attract other shoppers. Here are some techniques to improve your display.

*“People are naturally curious; if they see...people gathering..., they will want to know what is creating the interest.”*

## SET UP

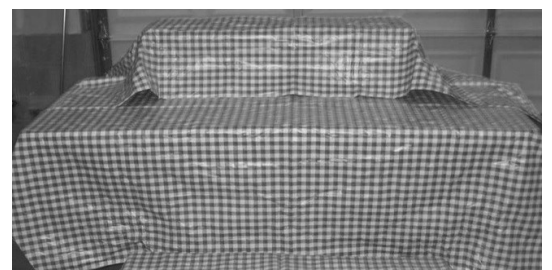
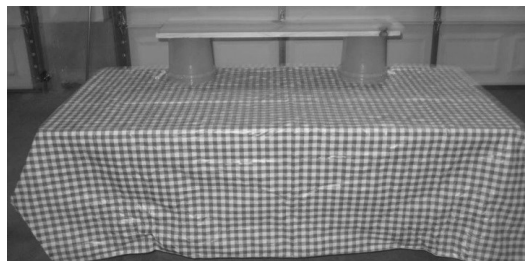
Arrange your space so that customers will have room to move around without blocking each other and the produce.

1. If you have a narrow display space, usually the best option is to create a **linear set-up** (set up tables in a line, NOT a u-shape which can crowd customers and make things hard to reach).



Linear display makes sure that food is easily reached by customers.

2. Create levels to increase display space and make sure everything is visible to your customers.



## 3. SIGNS

Label and display prices. Many customers can be hesitant to ask and will walk to another stand more clearly labeled.



**4. STACK IT HIGH AND WATCH IT FLY!** Keeping your table full and colorful creates an impression of bounty that appeals to customers.

- Put as much as makes sense on the table during busy times at the market. Your stand should look full throughout the day. You don't want customers who come later in the day to feel like they are getting stuck with leftovers.



- Use a smaller table if you don't have a lot of product.



Put a bucket lid in your basket + add produce on top for a fuller look.

- Try using **overflowing baskets**: “They have the added benefit of being easy to keep looking full. If you don't want to put out a whole basket of something, fill the basket partway with straw or newspaper, and place your product on top. The basket still looks full with a lot less product.”

- **Consolidate products**, as you run out, into smaller baskets. Bring multiple *containers* for display (flat trays, multiple basket sizes).

- **Tilt your boxes** and baskets toward customers so they can see at a glance what's available.
- Create **blocks of color**; all the yellow tomatoes in one box, all the reds in another. Masses of color are more visible from a distance.

**5. KEEP THINGS LOOKING CLEAN AND FRESH**

- **CLEAN** produce and dunk it in cold water after you harvest, it will last longer at the market.
- Take a **sprayer** with cold water and mist your produce often to keep it fresh and glistening.
- Keep extra things in water, in the shade or under your table.





# MARKETING & DISPLAY



## • 6. EDUCATE AND ENGAGE YOUR CUSTOMERS

- Sample products that you are having trouble selling or that you have a lot of.
- Provide **cooking and serving ideas** for unfamiliar items.
- Talk to folks about **seasonality** (“Why don’t you have tomatoes in

June?”), so that people can get used to the farmers market experience.

- Post a **farm sign**, customers can learn about YOU.

## 7. MAKE THINGS EASY FOR YOURSELF!

- Have a defined **transaction/weighing area**
- Make **bagging materials** easily available/pre-bag some items
- Keep **cash box** out of public reach or a wear cash apron
- Bring **broom** for neatness
- Bring a **calculator, scratchpad, pens/pencils**
- Bring extra **markers, blank signs, tape**

## 8. CUSTOMER RELATIONS

- **Stay at your stand.**
- **Wear a name tag, apron, t-shirt or something identifying you as the farmer.**
- Have **extra help** for crunch times
- The customer is always right! Stay courteous, even when tired.
- **Stand in front** of your table to welcome customers to the stand.
- **Knowing your customers** provides you with important information about how to package your products for the best sales. Some customers will want you to bag their produce, pre-weigh or bag items, label things with prices. You can accommodate all types of customers and keep them coming back for more!



Based on materials from the Virginia Cooperative Extension



**GROWING FOR MARKET** can provide people in the community with healthy food for their families, & help earn money for you & your garden. **The Share Table** is a way for gardeners sell their produce if they are not able to have their own stand at the Wednesday or Saturday Markets. You can bring as small an amount as you want, even one bunch of basil can make a difference!

## **HOW THE SHARE TABLE WORKS**

### **DROPPING OFF AT THE *SATURDAY* MARKET STEP BY STEP:**

1. Have all produce washed/bunched and looking presentable.
2. **BRING PRODUCE** to a Youth Intern at the Share Table between 8am-9:30am. After 11am, the market can slow down and produce is less likely to be sold. It is easier to process your produce carefully if it is dropped off early. Produce will **NOT** be accepted after 11am. You can drop off produce at UCC on Friday before 6pm.
3. If you need help, please call in advance! We can sometimes pick up produce on Fridays.
4. If your produce doesn't sell, it will be donated to the Youth Program or Food Pantry at the end of the day unless you come pick it up before 4pm.

### **DROPPING OFF AT THE *WEDNESDAY* MARKET STEP BY STEP:**

1. Have all produce washed/bunched and looking presentable.
2. **BRING PRODUCE** to a Youth Intern at the Share Table between 3pm-4:30pm. After 4:30pm, the market can slow down and produce is less likely to be sold. It is easier to put out your produce if it is dropped off early. Produce will not be accepted after 5pm.

# THE SHARE TABLE



# THE SHARETABLE

3. If you need help please call in advance! We can sometimes pick up produce **Tuesdays**. You can drop off at UCC on Tuesday or Wednesday anytime before 4pm.

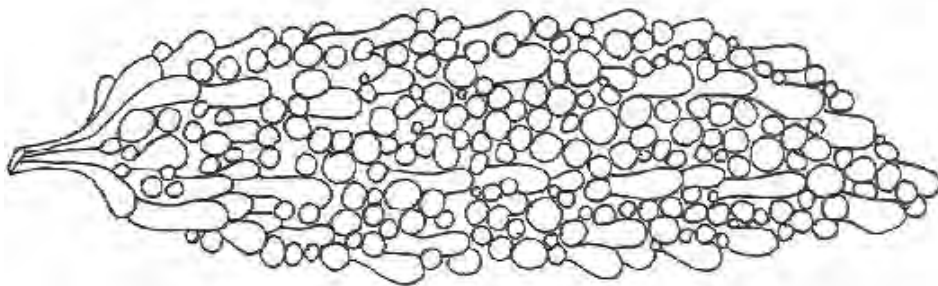
4. If your produce doesn't sell, it will be **donated** to the Youth Program or Food Pantry at the end of the day unless you come pick it up before 6pm.

## HOW TO GET REIMBURSED:

1. Gardener's get **90%** of the profit. 10% goes to run East New York Farms! Programs (like the Youth Program).

2. You can **request a check** at the **end of each month**. Checks need at least **1 week** to be written. If you would like a record of your sales, please also request it at this time. If you do not request a check by **January 1<sup>st</sup>** your money will be donated to East New York Farms!.





## WHAT IS BITTER MELON?

Bitter melon, with its botanical name *Momordica charantia*, is also known as Balsam Pear, Balsam Apple, Bitter Gourd, Carilla, Karela, Sorossie, Cerasse, Ku Gua, and Foo Gwa in different areas of the world. Bitter melon grows parts of East Africa, Asia, the Caribbean, South America, and BROOKLYN! It is eaten as well as used as an herbal medicine.

### CARIBBEAN CUSTOMERS FROM A WIDE VARIETY OF COUNTRIES EAT 3 DIFFERENT TYPES OF BITTER MELON

- **Long (10-16 inches long):** These are light green, with rounded bumps with a less bitter flavor.
- **Small (4-8 inches):** These are darker green, with rounded bumps, and are more bitter. The smaller fruits are used for flavor, and may be eaten stuffed.
- **Spiky (4-8 inches):** These are darker green and more bitter. In Brooklyn, they generally command a higher price.
- **Leaves:** Fresh or dried, these are used for medicinal teas.

*Preferences seem to be based on individual taste and cooking method, rather than country of origin.*

### VENDORS AT THE EAST NY FARMERS MARKET MENTION THAT THE BITTER MELON HAS 3 BENEFITS AS A MARKET CROP

- It generates “buzz.” Customers explain to other customers (who aren’t from the Caribbean) about cooking methods, health benefits, and how the crop tastes.
- Bitter melon generates many return customers.
- At our market, customers seemed to be more likely to spend cash than FMNP coupons on bitter melon.

Growing Bitter Melon for Caribbean + South Asian Customers in East NY



# Growing Bitter Melon for Caribbean + South Asian Customers in East NY

## PLANTING

*Bitter melon is a tender crop in the same family as cucumbers. Plants are long-lasting, & continue to produce through frost, though production peaks in August-September.*



- We recommend starting seeds approximately 3-4 weeks before planting outdoors (around April 20<sup>th</sup> in NY City). Seedlings should be planted outside after danger of frost is past (late May in NY City).
- Seeds can be rubbed with sandpaper or soaked overnight to break through the hard coating before planting, but either way germination tends to be poor (approximately 65%).
- We plant seedlings in a double row, with rows 2 feet apart and plants 18” apart within the row.



- **Trellis** plants to control vines, prevent deformed or discolored fruit, and to allow for maximum production.
- Planting into **black plastic**, to maximize moisture and heat, but this is not a requirement.

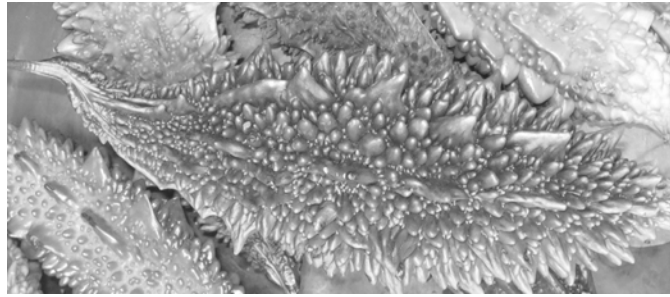
## HARVEST

- Fruits are harvested late July-October.
- Fruits should be harvested when they are plump but still green, about every 3 days. If allowed to ripen, they turn orange and sweet, at which point customers no longer want them (a Chinese customer made a sauce with the ripe fruit, and customers from Bangladesh sometimes want the sweet red seeds, but most bitter melon is eaten green.)
- Fruits can be kept refrigerated for several days.
- **Leaves** were harvested in September, once plants had reached a size sufficient that harvesting did not interfere with fruit production.



## VARIETIES

- Smooth: Hybrid Jumbo and Taiwan Large (from Evergreen Seeds)
- Spiky: India Long Green (from Evergreen Seeds)



## PESTS & DISEASES

- Crops do not suffer from any significant pests or pest damage in East New York, but could suffer from similar problems as other curcubits (like cucumbers), like powdery mildew and cucumber beetles. It is important to grow multiple varieties, water well and rotate crops to prevent these problems.

## PRICING

- Prices in Caribbean stores varied from \$1.50- \$2.25 per lb, with more charged for spiky fruits.
- For our organically grown fruit, we charge \$2.00/lb for smooth fruits (both long and small), and \$2.50/lb for the spiky fruit.

## NAMES

- Customers generally referred to the long and short smooth types of bitter melon as either *bitter melon* or *karela*.
- Spiky fruits are generally referred to as *karela*, or *soracee*.
- The leaves were referred to as *soracee* or *bitters*.

## RESOURCES

- Seeds: *Johnny's Selected Seeds, Evergreen Seeds*
- National Bitter Melon Council: [www.bittermelon.org](http://www.bittermelon.org)
- Save your own seed from ripe fruit!



Based on an article by Georgine Yorgey

Growing Bitter Melon for Caribbean + South Asian Customers in East NY



# Growing Peppers for Caribbean + South Asian Customers in East NY

**HOT PEPPERS** are an essential component of Caribbean cuisine in everything from jerk chicken to sofrito to the ubiquitous pepper sauces. *Capiscum chinense* is the dominant species of pepper in the region—popular varieties include Scotch Bonnet, Habanero, Aji Dulce, and Seasoning Peppers/ Pimentos. Most of these varieties are adapted to a tropical or sub-tropical climate, but grow well in the Northeast for a limited harvest period and have good marketing potential for the growing Caribbean community.



## SEEDING

Start peppers indoors, 8-10 weeks before the last frost. *C. chinense* germinates more slowly than *C. annum* (bell peppers, jalapenos, cayenne etc.), and requires temperatures in the 80-90° range to germinate properly. This is best achieved with a heated greenhouse or a heating mat.

## PLANTING

- **Spacing:** Peppers should be planted a minimum of 24” apart in rows, 30-36” is ideal.
- **Warm soil** temperatures are key—black plastic or solar mulch will significantly enhance growth.
- **Nutrients:** Peppers do well in rich, well drained soil. Plants should have access to adequate phosphorus and nitrogen, but too much vegetative growth. Calcium is essential for plant structure in *C. chinense*, which can grow significantly larger than *C. annum*. Before planting we use compost and **cover crops** (hairy vetch, winter rye, and crimson clover) to provide balanced nutrient levels, and supplement with bone meal for its phosphorus and calcium content.
- In our USDA Zone 7b climate, we plant our peppers around **June 1st**.
- Regular **irrigation** is essential to establish a healthy plant, but can be reduced once ripening begins.
- **Trellising:** *C. chinense* plants can grow to heights of 36” or larger (we had plants approaching 54” on our farm). Trellises or support are essential for facilitating harvest and preventing plant breakage. We use the Florida weave method on our farm because it is cost-effective, though tomato cages also work well on a smaller scale.



Peppers trellised and planted in black plastic



## HARVEST AND PROTECTION

- Picking the first round of peppers while they are green will increase overall production on the plant, though most customers prefer fully-ripe peppers.
- **Season Extension:** We found no significant difference in productivity or ripening with the use of row cover fabric in our pepper trial. The size of the plants and the trellis posts makes using row cover in the fall impractical--caterpillar tunnels (4-6' high) or high tunnels are a viable option for larger operations. We had 13-15 weeks of production for unprotected plants. Our first frost often comes after our market has ended, so there isn't a great need to protect the plants, though warmer temperatures in the fall will hasten fruiting and ripening.

## MARKETING

- Most of our peppers are marketed directly at the two East New York Farmers' Markets, and we've found that the color and variety of peppers help to attract customers to the stand.
- **Pricing:** We market half-pints for \$1.50, or about \$5 per pound. Some vendors at the East New York Farmers Market sell Scotch Bonnets for 25¢ each. When we have excess production, we sell to Caribbean restaurants that use the peppers in dishes and for pepper sauce.
- Peppers hold well on the plants and in storage (between 45-50°), and customers (especially restaurants) often make large purchases at once, making them a flexible and profitable crop for direct marketing and wholesale in Caribbean markets.



## RECOMMENDED VARIETIES

We trialed several different varieties of *C. chinense* to compare for productivity on our farm and popularity at our market in East New York, Brooklyn:

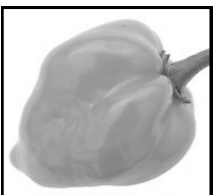
### Productivity

1. Orange Habanero
2. Mustard Habanero
3. Caribbean Red

### Popularity

1. Scotch Bonnet
2. Caribbean Red
3. Orange Habanero

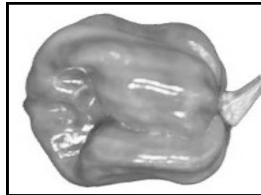
*Orange Habanero*



*Caribbean Red*



*Mustard Habanero*



*Yellow Scotch Bonnet*



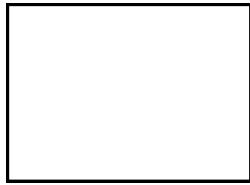
Growing Peppers for Caribbean +  
South Asian Customers in East NY



# Growing Peppers for Caribbean + South Asian Customers in East NY

**Other varieties** that do well on our farm and in our market but weren't part of our initial trials include:

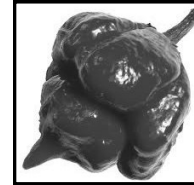
*Chocolate Habanero*



*Bhut Jolokia(Ghost)*



*Trinidad Scorpion*



*Bird Pepper*

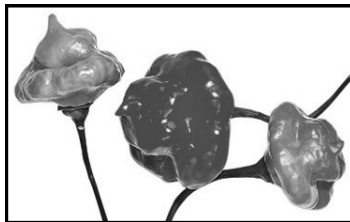


These peppers have some of the highest heat levels (measured in Scoville units) and attracted many repeat customers to our stand.

## Seasoning Peppers

Seasoning peppers, also known as pimentos, are cultivars of *C. chinense* that have been selected for sweetness and aroma, without the heat level of habaneros or Scotch Bonnets. These are used throughout the Caribbean in cooking. Ají Dulce is a Puerto Rican variety used in sofrito, and most other islands have distinctive varieties. Since the genes for heat are dominant in peppers, it's advisable to isolate seasoning peppers from hot varieties to prevent crossing. Seasoning peppers are comparatively rare in fresh markets, and have good marketing potential.

*Ají Dulce*



*Yellow Seasoning*



*Red Seasoning*



## SEEDS

### Sources

- Johnny's Selected Seed ([johnnysseeds.com](http://johnnysseeds.com))
- Redwood City Seeds ([ecoseeds.com](http://ecoseeds.com))
- Reimer Seeds ([reimerseeds.com](http://reimerseeds.com))
- Trade Winds Seeds ([www.tradewindsfruit.com](http://www.tradewindsfruit.com))

### Saving Seed

Peppers are an easy seed to save. Select the largest and ripest fruits from vigorous plants and remove the seed. Dry on paper towels and store in a cool, dark place. Saving seeds from locally adapted varieties is a great way to select for hardier strains in the Northeast. Customers are often the best source for new varieties of seeds.

*Based on materials by David Vigil.*

*This research project has been funded by Northeast SARE.*



THE PIGEON PEA is a legume belonging to the same family as soybeans. It may be an annual or a perennial shrub possessing a deep tap root system.

## USES + BENEFITS

Uses and benefits for the gardener and community include:

- It is **highly nutritious!** The pea contains high levels of protein and important amino acids.
- It **contributes to soil fertility** by forming nodules on roots which contain special bacteria naturally present in the soil. The bacteria capture Nitrogen from the air and transform it into a state which can be used by the plant for growth and development.
- It has a **deep root system** which enables it to use water and nutrients from deep within the soil.
- Its root system **improves the texture of the soil** and makes it suitable for water infiltration.



## TYPES + VARIETIES

There are essentially 2 types of pigeon pea plants:

- The **long-duration** or late type which takes a longer interval to produce.
- The **short-duration** or early type or variety which comes into fruiting early. In conditions which permit a short growing season the early type may be more suitable for cultivation

## PLANTING MATERIAL PREPARATION



In warm climates, sow seeds directly in the soil. However, where the season is short, seedlings should be grown indoors in late winter for transplanting in spring. The pigeon pea plant has a tap root system which has to be protected from damage and injury while transplanting. Seeds should be sown in **soil blocks** (made by a special soil block maker) or biodegradable pots. To minimize handling and avoid root injury, the entire block or pot with the seedling is then transplanted on prepared beds.

Growing Pigeon Peas for Caribbean + South Asian Customers in East NY

# Growing Pigeon Peas for Caribbean + South Asian Customers in East NY

## PLOT PREPARATION

The soil should be prepared with cover crop and compost early in the season to accommodate the transplanted seedlings.

## PLANTING

- Transplant seedlings at the end of April to early May. Transplanted seedlings about 4 - 6 weeks old are spaced in rows 2 - 3 ft apart and 12 - 18 inches between plants.
- Care should be taken when planting to avoid damage to the root system of the seedlings.
- A drip irrigation system can be installed to conserve water and reduce weed pressure.



## PESTS AND DISEASES

There are no known insect pests and diseases affecting this crop.

## FLOWERING AND FRUITING

The pigeon pea is a **daylight sensitive** plant and is referred to as a “short day” plant. Flower initiation will only begin when the plant receives 12 daylight hours. The early maturing variety will flower in 50-60 days while the long duration one will take 180 - 250 days. After flowering, the plant will need about 50 - 60 days to produce mature seeds.



## HARVESTING

The pods can be harvested when they are green if consumers desire them fresh or they can be harvested later when the pods are dry when only the seeds are required.

Based on materials by Mohammad Faroze



**DASHEEN** is one of two varieties of Taro and is characterized by a large central root (or corm). Eddo, which is the other variety, has a small central corm and several large cormels. The entire plant of the dasheen is consumed. The roots are rich in vitamin C, thiamine, Riboflavin, Potassium and Niacin. The young leaves are cooked and eaten as Calaloo.

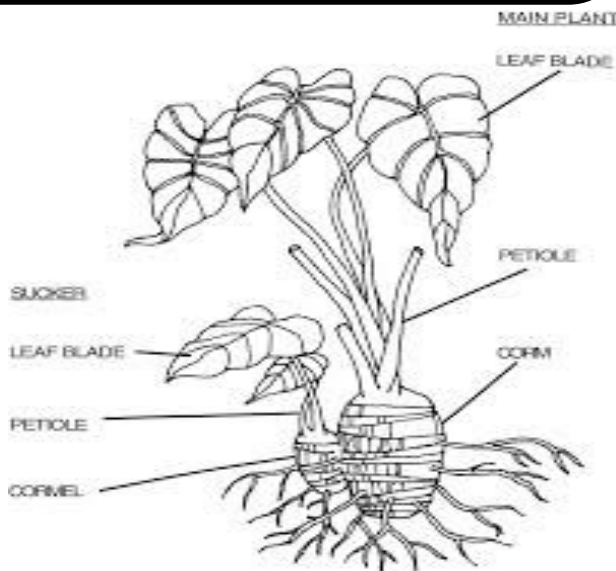
### HOW TO PLANT

There are 3 types of planting material that gardeners/farmers can use:

- **Side Suckers**, resulting from the lateral proliferation of the main plant from the previous crop.
- **Small corms or cormels** from the main plant from the previous crop.
- **Corm pieces**: when large roots are cut into smaller pieces.

When there are no side suckers or cormels available, use corm pieces by using a simple **Mini-setting Technique** to obtain planting material.

This should be done in **early to mid April** about **2 -3 weeks** before planting in late April or early May.



### The Mini-setting Technique

1. Select or purchase mature, fresh and healthy corms from a reputable grocery store.
2. Cut corms into horizontal slabs each weighing approximately 4 ounces. It may be necessary to dip cut corms in a solution of 3 fluid ounces bleach and 150 fluid ounces water to avoid rotting.
3. Place in potting material with cut end facing upwards.
4. Keep material moist but not wet to avoid rotting.
5. Lateral buds will appear in 10 to 14 days.
6. Suckers and cormels should be cleaned of roots, dead tissue and soil and kept in a greenhouse to develop good sprouts, especially if the time between harvesting and planting is lengthy.
7. It is important to store planting material taken from the previous crop in a cool, dry, dark place until spring planting.

### PLOT PREPARATION

The soil should be well tilled to enable corm bulking and development. Black plastic mulch with drip irrigation is then laid to cover the prepared plot. Hay

Growing Dasheen for Caribbean + South Asian Customers in East NY



# Growing Dasheen for Caribbean + South Asian Customers in East NY

or any other organic mulch may be used if black plastic is unavailable. Wood chips should **NOT** be used as a mulch material, because it binds up nutrients.

Plant at the end of **April to early or mid May** when the planting material has vigorous sprouts. Plant pre-sprouted plants 3- 5 inches deep in the planting holes. Space plants 1.5 - 2 ft apart. Plant early to ensure an early crop for market especially for those consumers who want the young leaves.

- It should be noted that **daylight** affects growth and development of the dasheen. Corm and cormel formation is promoted by short day conditions i.e. not greater than 12 hours daylight, while long day conditions i.e. greater than 12 hours daylight favors the other developmental stages. A greater chance of producing corms for the market may be achieved by planting mid-summer or June so as to coincide corm formation with the 12 hours daylight conditions in September.

## **WATER MANAGEMENT**

Dasheen needs a generous supply of water for good growth and development. In hot/warm conditions this becomes much more demanding. The soil should be constantly moist but not wet. Using **mulch** and **drip irrigation** ensures a regular supply of water and restricts the evaporation of moisture.

## **HARVEST**

### **Maturity**

- The time between planting and harvesting is about 6 - 8 months. There are a number of ways to determine the harvest maturity of dasheen:

### **For greens:**

- Customers like the younger leaves that emerge from the root. Leave some leaves for the plants to photosynthesize and continue production.
- Harvest with a clipper.
- Customers prefer to buy small bunches of young leaves that can be stored for a few days in a cooler.

### **For corms/cormels:**

- Older leaves will begin to yellow and die and corms may be visible at the soil surface. Corm formation begins about 3 months after planting. Cormel formation follows soon after.
- Clean and store taro tubers like sweet potatoes; harvest must be done very carefully to prevent disease and mold from affecting nicks and scars. It is done by loosening the soil using a garden fork. The main plant and suckers are then pulled from the soil. The corms are then cleaned of soil, trimmed of roots and prepared for the market.
- At the same time, planting material for the next season crop will have to be selected and prepared. Corms can be sold fresh and stored for around 2 weeks. They can also last longer if properly cured before storage resulting in the healing of wounds.



*Based on materials by Mohammad Faroze*



# HARVEST/MARKET SALES LOG

DATE:

CROP/VARIETY	AMOUNT HARVESTED (BUNCHES, POUNDS, ETC...)	PRICE	AMOUNT LEFTOVER	TOTAL SALES	WHAT DID YOU DO WITH THE LEFTOVER PRODUCE?
Example: Collard Greens	10 bunches	\$1.50	3 bunches	\$10.50 (7x1.5)	Donated to Soup Kitchen
			<b>TOTAL:</b>		

Based on materials by JustFood

